Materials sampling and testing methods and documentation procedures prescribed in chapter 8 of the CMM are mobilized into the contract per standard spec 106.3.4.1 and standard spec 106.3.4.3.1.

8.45.1 ACCEPTANCE PROCEDURES, DOCUMENTATION, AND REPORTING

Documentation and reporting for materials acceptance is equal in importance to Item Record Account documentation. The basis of acceptance for contract materials is accomplished in several ways, depending on the material. The type of reporting and documentation is a function of the acceptance type.

Materials test reporting and documentation is to be done using the WisDOT electronic Materials Tracking System (MTS). The MTS is a computerized filing and reporting system for construction materials tests and documents. All construction materials tested and inspected for WisDOT projects are reported on the MTS. The overall MTS has three basic components, the MTS (LAN/WAN attached), Materials Information Tracking System (MIT), and the Materials Tracking website. Region and central office laboratory personnel can enter data directly into the Oracle database via a Local Area Network (LAN) attachment provided through the MTS. The MIT is used for entering tests from the field.

The engineer should follow these guidelines for material documentation:

- Inspect all manufactured products as soon as possible after delivery.
    - Include all approved lists, certified sources, and pre-qualified products.
    - Record in the project record relevant inspection information.
- Verify that products delivered match the certifications, approved list, etc.
- Review all Certifications of Compliance and Certified Reports of Test and Analysis.
- Reference all Certifications, shop inspection reports, and other external documents using the MTS/MIT prefix 900 report.

All materials documentation and reporting must be completed and entered in the MTS no more than 60 working days after the work completion date.

Manufactured products must be inspected at the job site as soon as possible after arrival for evidence of damage or noncompliance even though these materials are covered by prior inspection testing or certification.

Those materials normally source inspected, but which arrive at the job without appropriate marking, indicating that they have been accepted at the source, must be field inspected or tested and the basis for acceptance must be documented in the inspector's diary.

8.45.1.1 Materials Testing and Acceptance Guide

The Materials Testing and Acceptance Guide, CMM 8.50 details many of the sampling, testing, and documentation requirements for various materials. The instructions shown in this guide are recommended minimum requirements. In many cases, it may be appropriate to increase the frequency and scope of certain testing and acceptance activities in order to properly administer the materials specifications. In all cases, it is appropriate to closely observe produced materials for visual evidence of changes in quality and to then adjust testing frequencies, as required, to adequately evaluate their quality.

Sampling and testing procedures of certain unique materials are described in the standard specs and other contract documents. The instructions in this guide are intended to supplement those in other contract documents.

8.45.1.2 E-Guide

A web based E-Guide system for developing a project specific sampling and testing guide is available at

http://www.atwoodsystems.com/eguide

The E-Guide lists the requirements for the standard bid items on a project. The materials acceptance requirements for non-standard special provision (SPV) items have to be defined by region or project personnel. Consult the region materials engineer or region person responsible for construction materials for guidance in this area.

The region person responsible for this area must be consulted regarding doubts as to the adequacy of

compliance of source inspected materials, need for field inspection and reports, waiver of testing, unlisted items, evaluation of certifications, or other questions regarding acceptance procedures.

Table 1 below defines the general documentation requirements for each materials acceptance type. Table 2 provides the MTS prefixes for all material types. Figure 1, Figure 2, and Figure 3 show example test reports.

Documentation Required	Acceptance Type	MIT/MTS Document	MTS Documentation Time Line	Remarks
MTS Report.	Verification tests- C.O. Laboratory	Various MTS prefixes as appropriate. See Table 2 for a list of prefixes.	No later than one week after completion of test.	Test entry by C.O. Lab personnel.
Materials Diary entry MTS reference report.	Approved Product Lists- WisDOT	Reference on MTS prefix 900 or 155	No later than 60 days after contract work completion date.	Test entry by project personnel.
Form DT 1823, Report of Shop Inspection. MTS reference report. Materials Diary entry.	Source or Shop Inspection	Reference on MTS prefix 900 or 155	No later than 60 days after contract work completion date.	Test entry by project personnel. Source sampled materials tested and reported by C.O. personnel (see verification tests C.O. Lab above).
Cert. of Compliance MTS reference report. Materials Diary entry.	Manufacturers Certification of Compliance	Reference on MTS prefix 900 or 155	No later than 60 days after contract work completion date.	See note below [1].
Cert. Report of Test MTS reference report. Materials Diary entry	Certified Report of Test	Reference on MTS prefix 900 or 155	No later than 60 days after contract work completion date.	See note below [1].
Verification tests-MTS Report.	Field Sampling and Testing	Aggregates- MTS prefix 162, 217 HMA- MTS prefix 254 HMA Nuclear Density- MTS prefix 262 Concrete Cylinders – MTS prefix 130 Earth Work Density- MTS prefix 232	No later than one week after completion of test.	All aggregate and HMA QV testing done must be entered by the qualified lab doing the testing. When QV and Companion Cylinder testing is done the data must be entered by the qualified laboratory doing the testing.
Quality Management Program (QMP) Quality Control (QC) tests. MTS Report. MRS Report (Structures Masonry Data)- contractor entry. MRS Report (IRI ride data) contractor entry.	Field Sampling and Testing	MTS Report 155	No later than 60 days after contract work completion date- prefix 155 data. MRS data is to be input by the contractor as it is developed.	Refer to Figure 1, Figure 2, and Figure 3 for examples of prefix 155 reports for verification of contractor QMP and QC testing.

[1] Certifications must be evaluated promptly for adequacy, completeness and compliance with applicable specifications. The certification reviewer must make appropriate notations, initial, and date the document at the time the review is completed.

Table 1: Documentation Requirements for Different Acceptance Types

Number	Description	Number	Description
101	Steel bars for concrete reinforcement	177	Corrugated polyethylene drainage pipe
103	Steel wire and mesh for concrete reinforcement	180	Concrete brick, block, and pipe
105	Steel plate beam guard	217	Aggregates
106	Uncoated steel strands for prestressed concrete	225	Aggregate quality
112	Steel sheets for culverts	230	Soils
115	High strength bolts, nuts, and washers	232	Soils nuclear density
120	Chain link fence fabric	250	Asphalt mix design
121	Rolled formed sections for chain link fence	254	Asphaltic mix verification
122	Pipe for chain link fence	257	Asphalt mix testing
123	Tension wire for chain link fence	259	Asphalt mix field changes
126	Woven wire fence fabric	262	Asphaltic pavement nuclear density
127	Barbed wire- 2 strands	310	Glass beads
128	Smooth wire for woven fence fabric	321	Pavement marking paint- white, water based
130	Concrete cylinders	330	Performance graded binder
131	Water for concrete	332	Emulsified asphalt
140	Concrete curing compound	334	Asphalt cement
150	Portland cement	801	Aggregate gradation
151	Ground granulated blast furnace slag	802	Portland cement concrete mixtures
152	Fly ash	803	Asphaltic pavement density testing
155	Miscellaneous materials	804	Asphaltic concrete mixtures
162	Fine & coarse aggregates for concrete	805	IAP soils nuclear density
170	Geotextiles	900	Reference report
172	Geogrid		

Table 2: MTS Prefix List

Test Number: 9D - 155 - 0002 - 2006

Labsite:

Training and Testing Site
District Tests
1st Avenue
Anytown, WI 56789

Materials Laboratory Testing System Tests On:

Miscellaneous Materials
Type: V - VERIFICATION

Main Project ID: 9999-99-99

Date Sampled:	Date Requested / Received:	Date Entered:
07/04/06		07/04/06
By: JVWHITE	By: JVWHITE	By: JVWHITE

Source: RIO QUARRY Legal Description: , NW, Section: 12, T: 11 N, R: 10, E County COLUMBIA

Manufacturer: GUD ROCK GUYS, INC

Other Associated Projects:

Material: QMP SUMMARY 1 1/4' CABC

Supplier:

Remarks: Y

EXAMPLE QMP AGGREGATE BASE COURSE REPORT

Description: CRUSHED AGGREGATE BASE COURSE QMP PROJECT SUMMARY

The QMP base course was accepted based on satisfactory QC testing. Review of QC test, Control chart, QC plan and other documents indicated that the specifications , required tests, and test frequencies were met. QC documents are on file with the project records. Results of verification tests show the materails conform to specification requirements.

Date placed	Tons	QC Tests	Verification tests	Source
4/28/2005	2138.54	1	1-217-9876-2005	XYZ Pit
5/5/2005	591.19			XYZ Pit
5/6/2005	478.48			XYZ Pit
5/11/2005	348.12	1		XYZ Pit
5/12/2005	912.24	1		XYZ Pit
5/13/2005	285.39			XYZ Pit
5/17/2005	494.14	1		XYZ Pit
5/18/2005	994.63	1		XYZ Pit
5/19/2005	1001.73			XYZ Pit
5/20/2005	1066.85	1	1-217-9999-2005	XYZ Pit
5/23/2005	1072.78	1		XYZ Pit
6/13/2005	2056	1		XYZ Pit
6/14/2005	3567	2		XYZ Pit
6/15/2005	2222	1		XYZ Pit
6/16/2005	2345	1		XYZ Pit
6/17/2005	489			XYZ Pit
Total =	20063.09			

Figure 1: Sample Report QMP Base Aggregate MTS Prefix 155

Test Number: 9C - 155 - 0001 - 2007

Labsite:

Testing and training site
Central Office Tests
1st St.
2nd City, USA 12345

Materials Laboratory Testing System Tests On:

Miscellaneous Materials
Type: V - VERIFICATION

Main Project ID: 9999-99-99

Date Sampled:	Date Requested / Received:	Date Entered:
09/01/06		09/01/06
By: J.V. WHITE	By: SW REGION	By: J.V. WHITE

Source: Legal Description: , , Section: , T: N, R: , County

Manufacturer: OK PAVERS INC.

Other Associated Projects:

Material: QMP ANCILLARY CONCRETE

Supplier:

Remarks: Y

Example report - QMP ANCILLARY CONCRETE

Description: QMP ANCILLARY CONCRETE
The contractor provided an acceptable QC plan and mix design- documents on file in the project record.
QC testing met the frequency and requirements of the QMP specification.

Field testing was summarized on DOT WS 5013 (located in the project record)

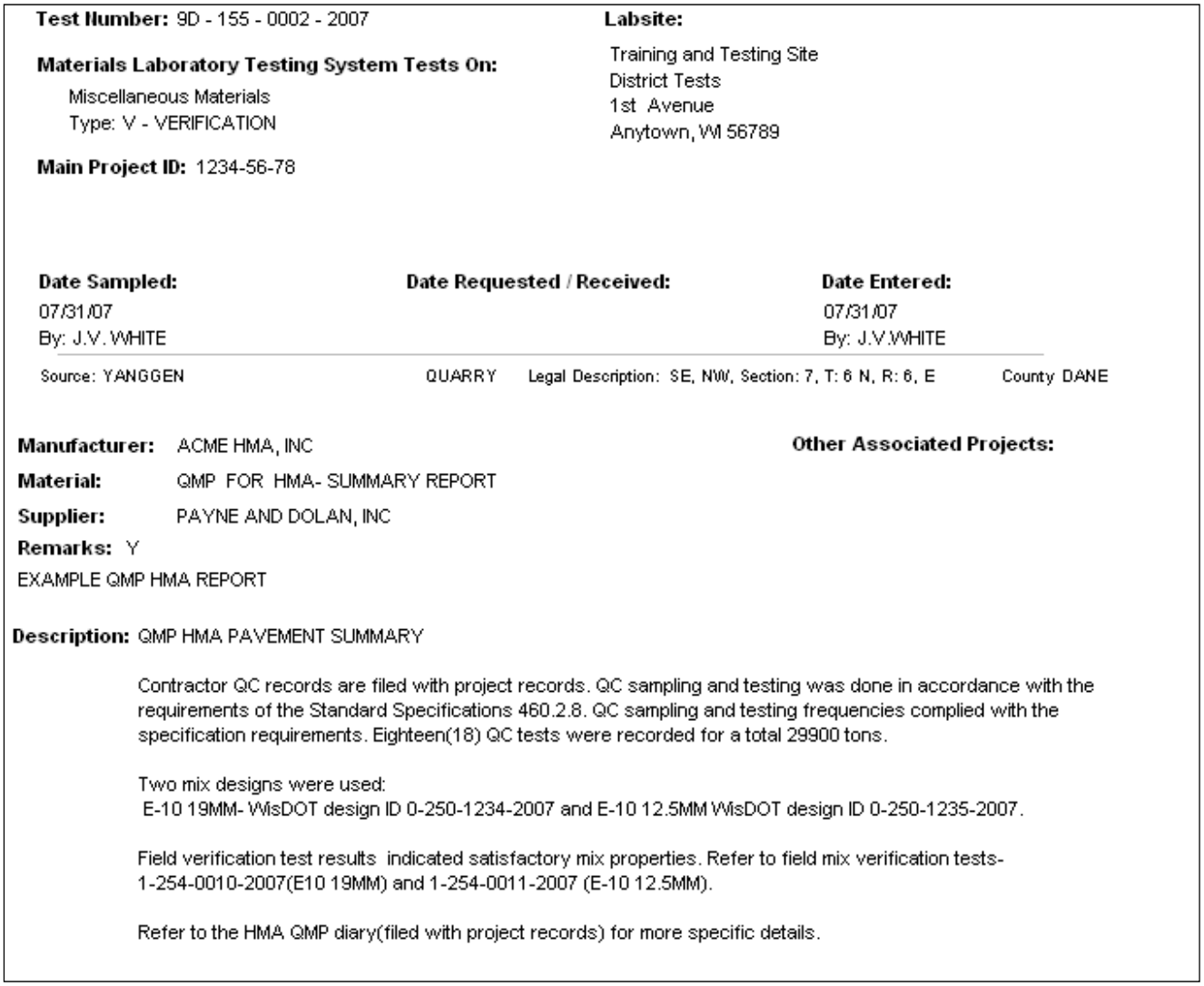
Cylinder compression strength records and printouts were satisfactory and are stored with the project records.

Results of verification tests showed the material conformed to specification reqiuirements.

Verification tests

Date	Location	C.Y.	% Air	Temperature	Slump
8/14/2006	C&G Sta. 23+10 - 38+4	102	5.6	78 F	1.5-inch
8/15/2006	6 foot Sidewalk- Sta. 21+10 - 53+87 LT	224	6.3	76 F	1.75-inch
8/16/2006	6 foot Sidewalk- Sta. 21+10 - 53+87 LT	226	5.5	72 F	1.5-inch

Figure 2: Sample Report Ancillary Concrete Summary MTS Prefix 155



Test Number: 9D - 155 - 0002 - 2007

Labsite:

Training and Testing Site
District Tests
1st Avenue
Anytown, WI 56789

Materials Laboratory Testing System Tests On:

Miscellaneous Materials
Type: V - VERIFICATION

Main Project ID: 1234-56-78

Date Sampled: 07/31/07 By: J.V. WHITE

Date Requested / Received:

Date Entered: 07/31/07 By: J.V.WHITE

Source: YANGGEN QUARRY Legal Description: SE, NW, Section: 7, T: 6 N, R: 6, E County DANE

Manufacturer: ACME HMA, INC

Other Associated Projects:

Material: QMP FOR HMA- SUMMARY REPORT

Supplier: PAYNE AND DOLAN, INC

Remarks: Y

EXAMPLE QMP HMA REPORT

Description: QMP HMA PAVEMENT SUMMARY

Contractor QC records are filed with project records. QC sampling and testing was done in accordance with the requirements of the Standard Specifications 460.2.8. QC sampling and testing frequencies complied with the specification requirements. Eighteen(18) QC tests were recorded for a total 29900 tons.

Two mix designs were used:
E-10 19MM- WisDOT design ID 0-250-1234-2007 and E-10 12.5MM WisDOT design ID 0-250-1235-2007.

Field verification test results indicated satisfactory mix properties. Refer to field mix verification tests-1-254-0010-2007(E10 19MM) and 1-254-0011-2007 (E-10 12.5MM).

Refer to the HMA QMP diary(filed with project records) for more specific details.

Figure 3: Sample Report QMP HMA Pavement Summary MTS Prefix 155

8.45.2 ACCEPTANCE TYPES

The following information is for personnel engaged in the inspection, sampling, testing, and acceptance of materials to be incorporated in highway construction work performed under the jurisdiction of the Wisconsin Department of Transportation. Requirements of the independent assurance sampling and testing program are not included in this section.

Materials may be approved or accepted by a variety of procedures listed below. Other materials are inspected, tested, or otherwise evaluated in the normal course of project administration of materials specifications. Inspection and testing operations are done at a frequency and scope deemed necessary for adequate control of quality and compliance with specifications. Records of activities must be promptly and fully documented in the project records, including identification of sources, types, sizes, brands, rates of use, and other pertinent information.

8.45.2.1 Verified Tests

Some materials require central laboratory testing of submitted samples. Generally, acceptance of the material is reserved pending availability of laboratory test results. Prompt submittal of samples will ensure timely test results. All laboratory test results are available to the engineer on the Materials Tracking System (MTS). Field offices can access test reports via the WisDOT MTS Website at:

http://www.atwoodsystems.com/materials/

All test reports and references must be included in the test folder and Test Report Record.

8.45.2.2 Approved Products, Manufacturers, and Suppliers Lists

Lists of products pre-qualified by the department for use on Wisconsin DOT projects are compiled and maintained by the Bureau of Technical Services. These lists include pre-qualified products, approved suppliers, and certified sources of specific materials that exhibit satisfactory compliance to a given specification. Some of the major methods of pre-qualification are listed below:

- Pre-qualification testing, inspections, and evaluation.
- Process control inspections with certification.
- Process control inspection with random department verification testing.
- Independent third party plant certifications.

The department includes products on these lists based on the results of prior testing and a satisfactory performance history on departmental projects. The department may retest or re-inspect products after delivery to the project site to verify that they conform to the contract.

Although approved for use, any of these materials are subject to inspection, test, certification of compliance, or certified reporting of tests to the appropriate specifications or material properties, and are subject to rejection at any time. The lists are to be updated on an as-needed basis. Contact information for each of the product categories is listed on the pages for the respective material.

The department maintains lists of acceptable products, manufacturers, and suppliers on the following site:

http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm

Acceptance of these products is based on the product appearing on an approved list or being from an approved fabricator, manufacturer, or certified source, and in some cases, a visual inspection upon arrival at the project site. If a product on an approved list does not perform as required, contact the region person responsible for this area. Each of the approved list items has a listed contact person for the item.

8.45.2.3 Shop or Source Inspection

Certain materials may be accepted on the basis of inspection and/or tests at the source of fabrication or manufacture. Those materials will bear tags, stamps, or other markings indicating that they have been accepted, and may be incorporated into the work if found to be satisfactory on the basis of job-site examination. A shop inspection report or a laboratory report will normally follow which will document the original inspections or testing. These materials and references to corresponding inspection or test reports must be included in the Test Report Record.

When materials that require shop or source inspection arrive on a project with no visible evidence of having been inspected and accepted, verification of acceptance of the materials will be made by contacting the region person responsible for this area. A diary notation must be made describing basis of acceptance of the materials.

Standard spec 106.3.2 stipulates that the department reserves the right to retest or re-inspect plant-inspected materials after delivery to the project site and to reject materials that are found not to comply with the contract requirements.

8.45.2.4 Sampling and Testing

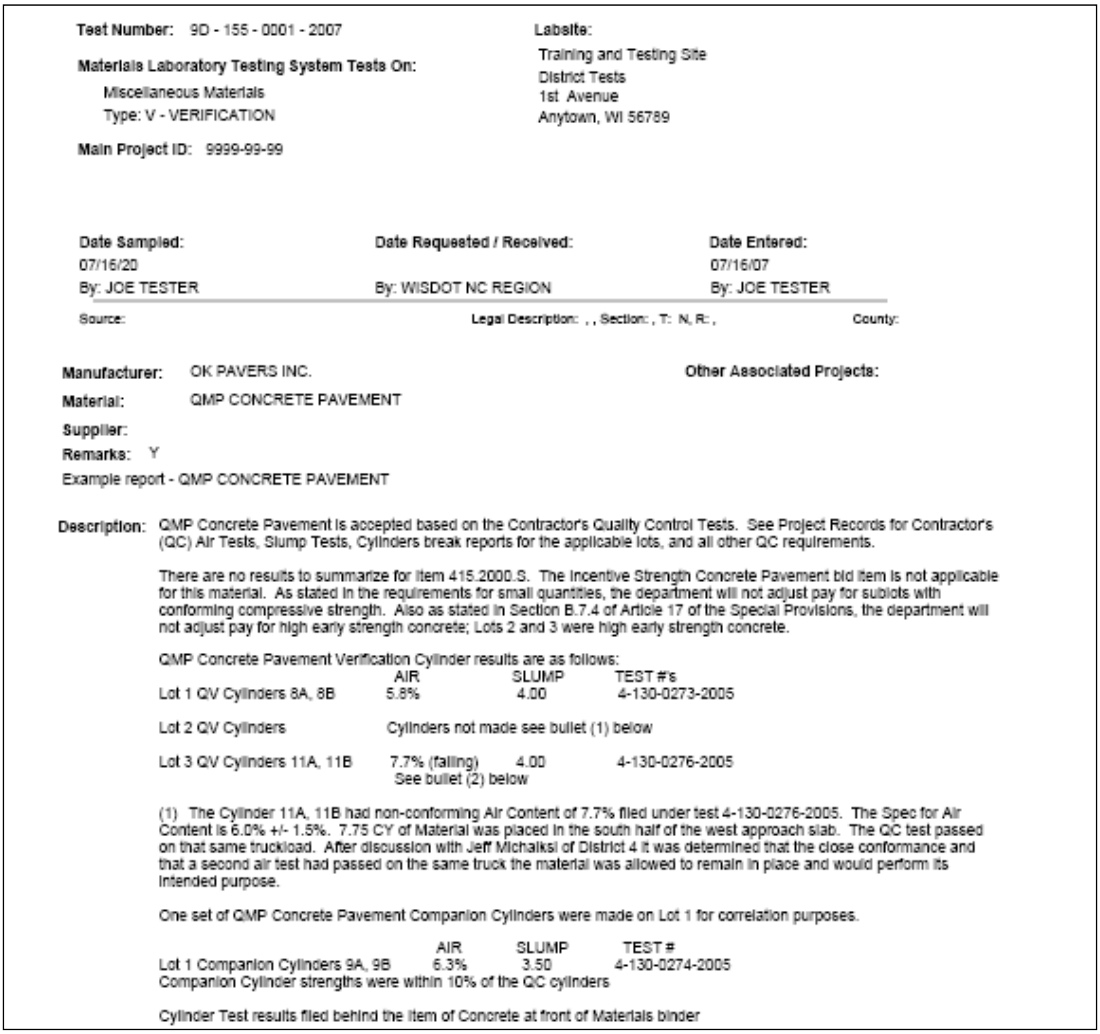
Representative samples of materials for testing are taken at the job site or at the source of supply in accordance with procedures of the governing specs or in accordance with standard practices of the department.

All department and contractor personnel responsible for sampling and testing materials must be qualified under a department-accepted program for the materials they are working with. Likewise, all laboratories used in the sampling and testing of materials incorporated into the work must be properly qualified. See the Materials Testing and Acceptance Guide in CMM 8.50 for further information and instructions.

The results of tests and inspections must be documented on reports of field inspection or by diary entries, whichever is applicable. Several similar materials may be included on a single report entry when appropriate. This form is available in the Materials Tracking System (MTS).

One copy of each completed report is to be attached to the Test Report Record following project completion. An example of a completed report with prefix 155 from Materials Information Tracking is shown in Figure 4.

Also, in special cases, when field inspection is specifically requested by Bureau of Structures - Bridge Fabrication Unit, a copy of the report must be sent to Bureau of Structures - Bridge Fabrication Unit immediately after inspection. Copies of all reports of field inspection of material must be included with the Test Report Record when the project is completed.



Test Number: 9D - 155 - 0001 - 2007

Materials Laboratory Testing System Tests On:
Miscellaneous Materials
Type: V - VERIFICATION

Main Project ID: 9999-99-99

Labsite:
Training and Testing Site
District Tests
1st Avenue
Anytown, WI 56789

Date Sampled:	Date Requested / Received:	Date Entered:
07/16/20		07/16/07
By: JOE TESTER	By: WISDOT NC REGION	By: JOE TESTER

Source: Legal Description: , , Section: , T: N, R: , County:

Manufacturer: OK PAVERS INC.
Material: QMP CONCRETE PAVEMENT
Supplier:
Remarks: Y
Example report - QMP CONCRETE PAVEMENT

Other Associated Projects:

Description: QMP Concrete Pavement is accepted based on the Contractor's Quality Control Tests. See Project Records for Contractor's (QC) Air Tests, Slump Tests, Cylinders break reports for the applicable lots, and all other QC requirements.

There are no results to summarize for item 415.2000.S. The Incentive Strength Concrete Pavement bid item is not applicable for this material. As stated in the requirements for small quantities, the department will not adjust pay for sublots with conforming compressive strength. Also as stated in Section B.7.4 of Article 17 of the Special Provisions, the department will not adjust pay for high early strength concrete; Lots 2 and 3 were high early strength concrete.

QMP Concrete Pavement Verification Cylinder results are as follows:

	AIR	SLUMP	TEST #'s
Lot 1 QV Cylinders 8A, 8B	5.8%	4.00	4-130-0273-2005
Lot 2 QV Cylinders	Cylinders not made see bullet (1) below		
Lot 3 QV Cylinders 11A, 11B	7.7% (failing) See bullet (2) below	4.00	4-130-0276-2005

(1) The Cylinder 11A, 11B had non-conforming Air Content of 7.7% filed under test 4-130-0276-2005. The Spec for Air Content is 6.0% +/- 1.5%. 7.75 CY of Material was placed in the south half of the west approach slab. The QC test passed on that same truckload. After discussion with Jeff Michalksi of District 4 it was determined that the close conformance and that a second air test had passed on the same truck the material was allowed to remain in place and would perform its intended purpose.

One set of QMP Concrete Pavement Companion Cylinders were made on Lot 1 for correlation purposes.

	AIR	SLUMP	TEST #
Lot 1 Companion Cylinders 9A, 9B	6.3%	3.50	4-130-0274-2005

Companion Cylinder strengths were within 10% of the QC cylinders

Cylinder Test results filed behind the item of Concrete at front of Materials binder

Figure 4: Example Report of Field Inspection of Material

8.45.2.5 Product Certifications

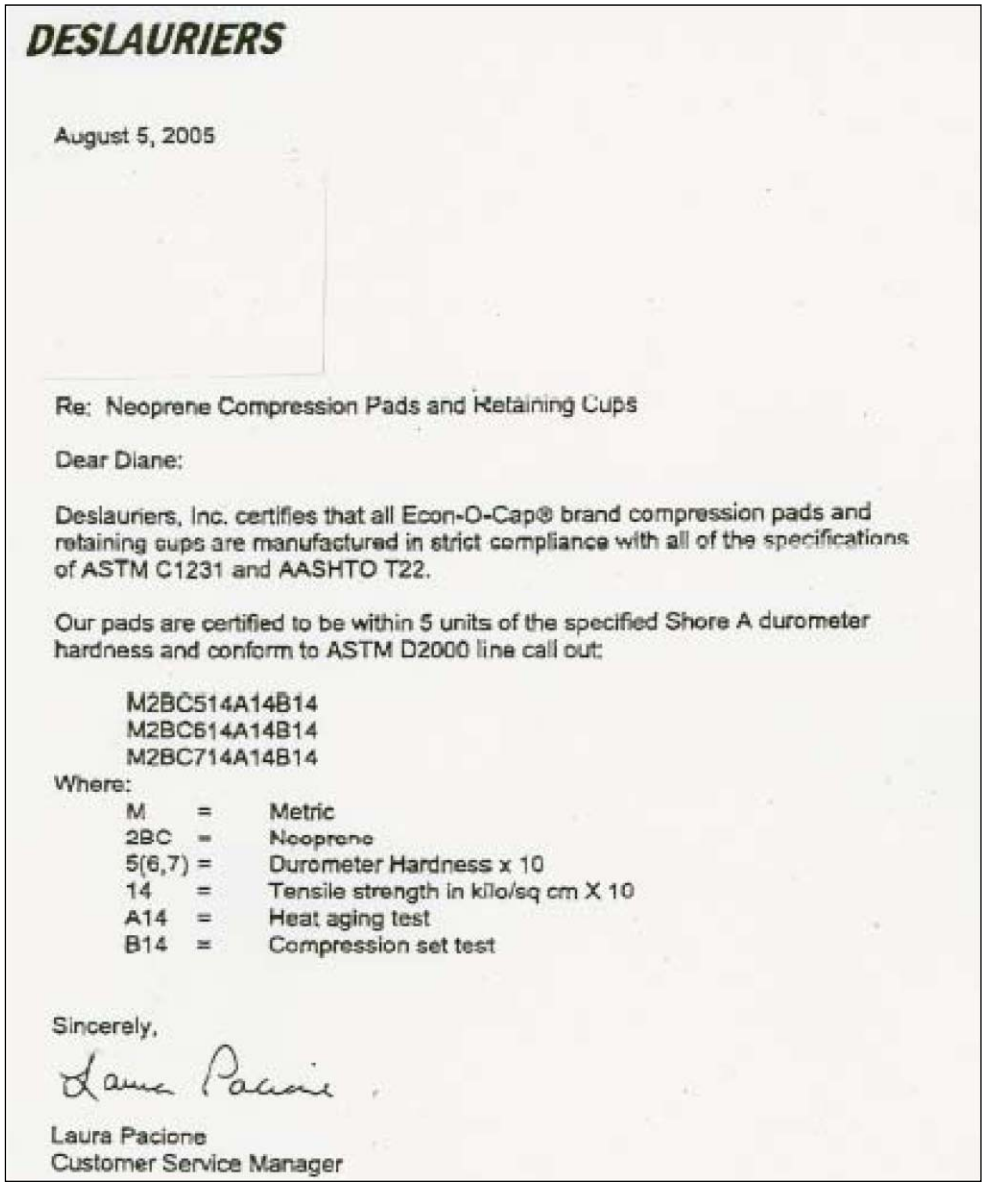
Certification Programs are in use for asphalt cement, Portland cement, bridge metal secondary fabrication items, and pre-stressed concrete members. Under these programs, plants that comply with the WisDOT certification procedures may furnish products to WisDOT projects for acceptance based on the plant's certification of product compliance with the pertinent specification and contract requirements.

8.45.2.6 Manufacturer's Certification of Compliance

Some materials require a manufacturer's certified report of test or analysis, while for all manufactured items, the contractor must furnish a certification of compliance upon request of the engineer (see standard spec 106.3), either as sole documentation for acceptance or as supplemental documentation. A manufacturer's certification of compliance must include:

1. Name of the manufacturer or of the supplier.
2. Name and use of the product.
3. Statement of the specification that the product meets, such as AASHTO and/or ASTM and the specification number, or when applicable, the contract special provisions. In some cases it may be the manufacturer's specifications.
4. Signature and title of a person in responsible charge of certifying the product who can bind the company and the signer's job title.

An example of a correct Certification of Compliance is shown in Figure 5.



DESLAURIERS

August 5, 2005

Re: Neoprene Compression Pads and Retaining Cups

Dear Diane:

Deslauriers, Inc. certifies that all Econ-O-Cap® brand compression pads and retaining cups are manufactured in strict compliance with all of the specifications of ASTM C1231 and AASHTO T22.

Our pads are certified to be within 5 units of the specified Shore A durometer hardness and conform to ASTM D2000 line call out:

M2BC514A14B14
M2BC614A14B14
M2BC714A14B14

Where:

M	=	Metric
2BC	=	Neoprene
5(6,7)	=	Durometer Hardness x 10
14	=	Tensile strength in kilo/sq cm X 10
A14	=	Heat aging test
B14	=	Compression set test

Sincerely,

Laura Pacione

Laura Pacione
Customer Service Manager

Figure 5: Example of a Correct Certification of Compliance

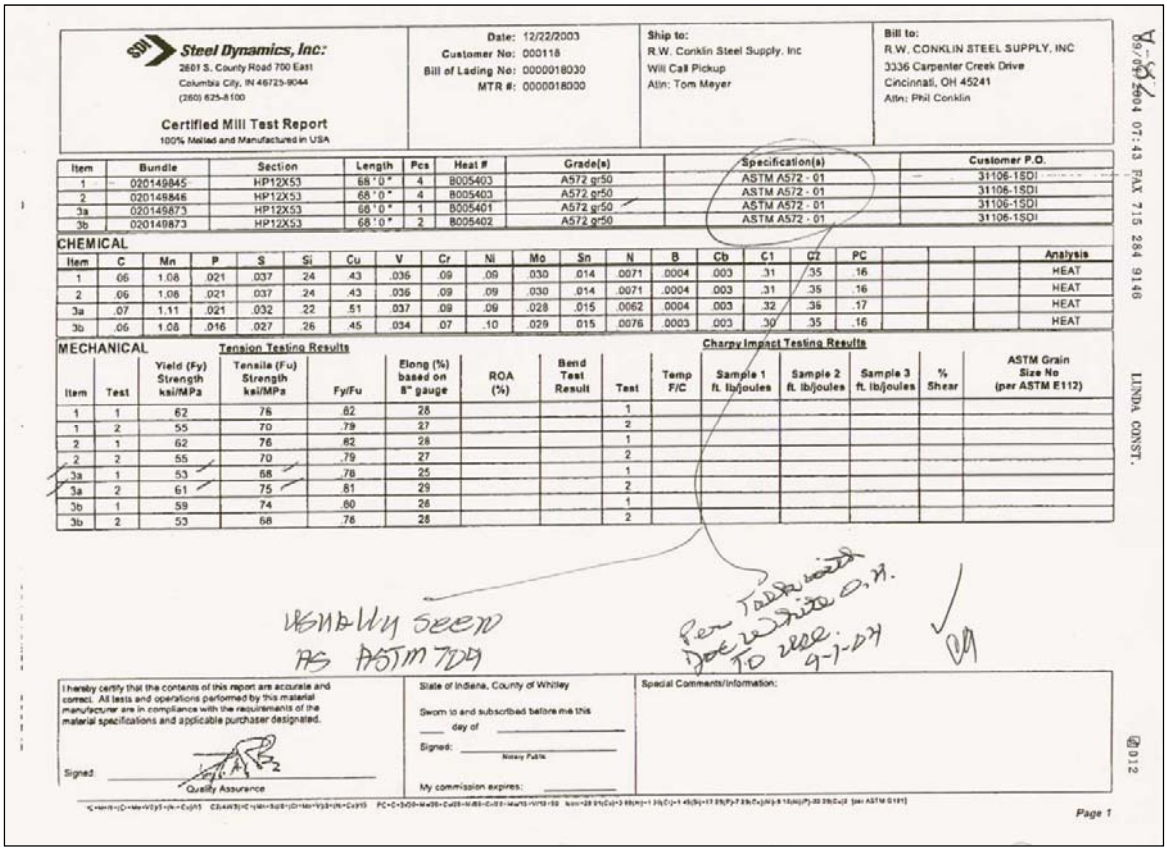
Note: ASTM 2000 line call out must be cited for the Durometer hardness of pads used. 50 Durometer pads are suitable for use for strengths 1500- 6000 psi. 60 Durometer pads are for strengths 2500- 7000 psi. 70 Durometer pads are used for 4000-7000 psi. The above document should cite or be accompanied by an invoice showing the lot or batch of the pads used.

8.45.2.7 Certified Report of Test or Analysis

A manufacturer's certified report of test or analysis must include the following:

1. Name of the manufacturer or of the supplier.
2. Name and use of the product.
3. Statement of the specification that the product meets such as AASHTO and/or ASTM and the specification number, or when applicable, the contract special provisions. In some cases it may be the manufacturer's specifications.
4. Lot, batch, heat numbers, etc., applicable to the material delivered.
5. Test results for both physical and chemical test requirements as specified.
6. Signature and title of a person in responsible charge of the testing facility.

An example of a correct Certified Report of Test and Analysis is shown in Figure 6.



Steel Dynamics, Inc.
2601 S. County Road 700 East
Columbia City, IN 46725-9044
(260) 625-8100

Certified Mill Test Report
100% Melted and Manufactured in USA

Date: 12/22/2003
Customer No: 000118
Bill of Lading No: 0000018030
MTR #: 0000018030

Ship to:
R.W. Conklin Steel Supply, Inc
Will Call Pickup
Attn: Tom Meyer

Bill to:
R.W. CONKLIN STEEL SUPPLY, INC
3336 Carpenter Creek Drive
Cincinnati, OH 45241
Attn: Phil Conklin

Item	Bundle	Section	Length	Pcs	Heat #	Grade(s)	Specification(s)	Customer P.O.
1	020149845	HP12X53	68' 0"	4	B005403	A572 gr50	ASTM A572 - 01	31106-1SDI
2	020149846	HP12X53	68' 0"	4	B005403	A572 gr50	ASTM A572 - 01	31106-1SDI
3a	020149873	HP12X53	68' 0"	1	B005401	A572 gr50	ASTM A572 - 01	31106-1SDI
3b	020149873	HP12X53	68' 0"	2	B005402	A572 gr50	ASTM A572 - 01	31106-1SDI

CHEMICAL

Item	C	Mn	P	S	Si	Cu	V	Cr	Ni	Mo	Sn	N	B	Cb	C1	C2	PC				Analysis
1	.06	1.08	.021	.037	.24	.43	.036	.09	.09	.030	.014	.0071	.0004	.003	.31	.35	.16				HEAT
2	.06	1.08	.021	.037	.24	.43	.036	.09	.09	.030	.014	.0071	.0004	.003	.31	.35	.16				HEAT
3a	.07	1.11	.021	.032	.22	.51	.037	.09	.09	.028	.015	.0062	.0004	.003	.32	.36	.17				HEAT
3b	.06	1.08	.016	.027	.26	.45	.034	.07	.10	.029	.015	.0076	.0003	.003	.30	.35	.16				HEAT

MECHANICAL — Tension Testing Results — Charpy Impact Testing Results

Item	Test	Yield (Fy) Strength ksi/MPa	Tensile (Fu) Strength ksi/MPa	Fy/Fu	Elong (%) based on 8" gauge	ROA (%)	Bend Test Result	Test	Temp F/C	Sample 1 ft. lb/joules	Sample 2 ft. lb/joules	Sample 3 ft. lb/joules	% Shear	ASTM Grain Size No (per ASTM E112)
1	1	62	76	.82	28			1						
1	2	55	70	.79	27			2						
2	1	62	76	.82	28			1						
2	2	55	70	.79	27			2						
3a	1	53	68	.78	25			1						
3a	2	61	75	.81	29			2						
3b	1	59	74	.80	26			1						
3b	2	53	68	.78	28			2						

Visually seen
AS ASTM 709

Per Tom with Joe White O.M.
TO 1222 9-1-04

I hereby certify that the contents of this report are accurate and correct. All tests and operations performed by this material manufacturer are in compliance with the requirements of the material specifications and applicable purchaser designated.

Signed: _____ Quality Assurance

State of Indiana, County of Whitley

Sworn to and subscribed before me this ___ day of _____

Signed: _____ Notary Public

My commission expires: _____

Special Comments/Information:

Page 1

09/09/2004 07:43 FAX 715 284 9146 LINDA CONST. 012

Figure 6: Example of Certified Report of Test and Analysis

Certifications must be evaluated promptly for adequacy, completeness, and compliance with applicable specifications. The certification reviewer will make appropriate notations, initial, and date the document at the time the review is completed. Certifications of compliance usually are retained by the contractor and must be made available upon request of the engineer. Certified reports of tests or analysis usually will be collected by the engineer but may be retained by the contractor, as above, for certain items.

Except for the following cases, copies of certifications either requested from the contractor or collected by the engineer must be listed on and included with the Test Report Record:

1. If the acceptance data has been electronically reported, list on the Test Report Record and file with the project records.
2. In the case of the plant materials certificate of inspection and the fabricator's certification statement for metallic coated corrugated steel products, documents are retained with other project records in the region.
3. In the case of manufacturer's certificate of compliance and certified report of test or analysis for prefabricated structural steel members and associated items received directly from the manufacturer, documents must be reviewed promptly by the region person responsible for this area and proper notation must be made on the certifications.
4. In the case of electrical material requiring certificates of compliance and/or shop drawings see standard spec 657.2.1. This is the typical and only acceptable method of complying with the procedure as outlined, whether for poles or any other required item as stated in other sections of the standard specifications.

One copy of the certificate of compliance and one copy of the accompanying shop drawing for any structural material (arms, poles) should be sent to the Electrical Engineer, Central Office Traffic. This paperwork is for informational review of structure compliance by the bridge office on a random basis in the future, and not for product review and/or approval.

The engineer or WisDOT region electrical section journeymen personnel may make reviews for acceptance of material submitted by contractors for use in projects. This includes poles, arms, and other items requiring certificates of compliance. This method of review is for timesaving reasons. Should the engineer or region

electrical personnel wish to send catalog sheets, shop drawings, and certificates of compliance to the Bureau of Highway Operations - System Operations and Electrical Engineering, for review as in the past, that procedure is entirely acceptable.

Material catalog sheets, shop drawings, and certificates of compliance that are questionable, or items submitted for "equal" status should be sent to the Bureau of Highway Operations - System Operations and Electrical Engineering section for review.

8.45.3 DIARY DOCUMENTATION AND VISUAL INSPECTION

Certain materials used on department projects require visual field inspection or acceptance without formal report. Documentation for these types of materials must be in the inspector's diary and must include manufacturer, brand, model, source, lot/batch, heat number, application rate, markings, type, size, system, species, etc. Information related to the basis of acceptance, compliance with requirements, visual job site inspection, product data sheets/labels, etc. must be included when they are applicable and made available when considered to be appropriate.

Diary entries must include the following:

- Description: brand, model, type, dimensions, lot, heat etc.
- Quantity.
- Manufacturer, source and vendor.
- Evaluation and basis for acceptance - visual inspection remarks, product condition, compliance to specifications, etc.

Reference the diary as an external document to list on the Test Report Index (MTS prefix 900). A sample format for diary documentation is shown below in Table 3.

Date	Description	Manufacturer	Evaluation and Basis for Acceptance
3/11/2006	CSS-1 Asph. Emulsion for tack coat, diluted with 50% water, 2300 Gallons	Koch- Dubuque	Type acceptable per specifications. Performed well at application rate of 0.025 gals/SY. See truck invoice in project record.
3/12/2006	Reinf. Conc. Pipe 18"-120 LF 24"- 224 LF 36"- 608 LF	Madison Conc. Pipe, Madison, WI	Pipe was new and undamaged shipped from a pre-qualified source, cert. statement on shipping invoice.
4/1/2006	High Strength Bolts, nuts, washers, ¾"X 3" galvanized Type A325, Lot 4321, RC Lot #5678 400 units each	Uny-Tite Fasteners Fort Bolt, Missouri	All shipped in same drum, drums were well marked & undamaged. Label matches Cert Report of Tests. Material was clean and well lubricated. Mill certs., Manuf. Rotational capacity tests and Contractor reports of field Rotational Capacity tests are on file.
5/1/2006	Steel Plate Beam Guard panels Heat #708-12.5 foot, 50 panels Heat #699-25 foot, 140 panels	Gregory Steel supplied thru Arbor Green, Portage	Material was new and undamaged as installed, free from defects and white rust. Ht nos. supplied listed for pre-qualified shipment B.O.L #9999, Gregory- Arbor Green- 2006 tested and approved Beam Guard shipments list.

Table 3: Example of a Materials Inspection Diary Format

The following lists are for guidance and are not to be considered as including all material items that must or may be reported in the diary. Specific project conditions may warrant additions or deletions to these lists.

8.45.3.1 Materials Requiring a Diary Entry

Following is the list of items for which a diary entry must be made:

- Anchor bolts and rods.
- Asphaltic surface (section 465).
- Emulsified asphalt for tack coats when quantity exceeds 2500 gallons (9500 L).
- Bronze plates, lubricated.
- Cable for guard fence.
- Concrete admixtures:
    - Liquid.

    - Non-shrink admixture (solid).
- Concrete, clear protective coating.
- Concrete curing agents.
    - Liquid membrane.
    - White pigmented.
    - Clear & translucent.
- Concrete masonry reinforcement.
    - Bar steel -- minor quantities.
    - Bar steel (epoxy coated) -- minor quantities.
    - Concrete expansion anchor assembly.
    - Dowel bar assemblies (coated).
    - Fabricated steel bars.
    - Welded steel wire fabric.
- Concrete, precast catch basins, inlets, and manholes.
- Concrete, protective surface treatment.
- Culvert, sewer pipe and underdrains:
    - Concrete pipe products.
    - Corrugated metal pipe products.
    - ABS drainage pipe (underdrain).
    - Polyvinyl chloride (PVC) (drainage pipe underdrain).
    - Composite pipe (sewer).
    - ABS.
    - Polyvinyl chloride (PVC).
    - Structural plate bolts.
- Culvert pipe end sections (apron end walls).
- Delineators:
    - Posts.
- Drains and downspouts (bridges).
- Fencing, screen:
    - Aluminum panels.
    - Steel panels.
- Geotextile fabric – if contract quantity does not require sampling.
    - Silt fence.
    - Type C.
    - Type DF.
    - Type FF.
    - Type H.
    - Type MS.
    - Type R.
    - Type SAS.
    - Type SR.
- Joint sealers.
    - Cold poured silicon type.
    - Hot poured elastic type.
    - Non-bituminous.
    - Preformed elastomeric.
    - Compression and lubricant - adhesive.
- Lumber and timber, treated.
- Paint:
    - For use on metal.
- Piling:
    - Wood (treated and untreated).

        - Piling steel.
        -Sheet (permanent installation).
        -Bearing.
        -Shell.
    - Portable crash cushions and cartridges.
    - Posts, treated wood:
        - Guardrail.
        - Right of way (security fence).
        - Screen fence.
        - Sign.
    - Signing:
        - Base, face and message.
        - Structural units.
    - Steel grid floor.
    - Steel marker posts.
    - Steel plate beam guard:
        - Sheet steel beams.
        - End shoe sections.
        - Terminal sections.
        - Anchor assembly.
    - Structural steel:
        - Bridges:
        -Carbon steel shafting.
        -Castings, bronze.
    - Waterproofing materials:
        - Rubberized membrane.
    - Well pipe, pump, and appurtenances for drilled or driven wells.

8.45.3.2 Other Materials to Consider for a Diary Entry

These non-critical items should be visually inspected at the job site, but normal documentation is not required. The inspector is encouraged to make a diary entry when he/she deems it is necessary.

The following list of items may be considered for diary entries:

- Agricultural lime (see standard spec 629.2.2).
- Emulsified asphalts for tack coats when the quantity is less than 1500 gallons (5680 L).
- Block & brick, concrete (record I.D. mark and/or color) - when on the approved list.
- Bridge seat protection.
- Calcium chloride.
- Chairs, space strips, stays & parting strips (concrete construction).
- Concrete admixtures - when on the approved list.
    - When used as an accelerator (record concentration and addition rate).
- Concrete curing agents:
    - Burlap.
    - Burlap, polyethylene coated.
    - Polyethylene sheeting or paper.
- Concrete masonry reinforcement:
    - Dowel caps.
    - Hook bolts for incidental work.
- Culvert, sewer pipe and underdrains:
    - Mastic joint sealer.
- Drain tile (clay and concrete).
- Electrical conduit, metallic or non-metallic (when UL label is affixed).
- Expansion bolts.

- Fencing, chain link:
    - Miscellaneous hardware.
- Fencing, woven wire:
    - Miscellaneous hardware (including braces and smooth wire).
- Fertilizer (see standard spec 629.2.1).
- Fiber pulpboard tubes (forms and voids).
- Form insulation.
- Form oil.
- Silt screen turbidity barrier.
- Hydrated lime.
- Joint fillers:
    - Preformed.
- Malleable iron castings.
- Manhole steps.
- Nameplates.
- Paint:
    - For use on wood.
- Pavement marking (temporary).
    - Glass spheres.
    - Reflectorized paint.
    - Reflectorized tape.
- Plant stock - when tagged from a certified nursery.
- Riprap.
- Seed.
- Sheet aluminum, copper, lead, and zinc (except sheet lead for bearing pads).
- Sod and sod netting.
- Steel pipe and fittings (general purpose).
- Steel plate beam guard:
    - Mounting and installing hardware.
    - Reflectors.
- Structural steel:
    - General purpose.
- Stone for mortar rubble masonry.
- Timber connectors and hardware.
- Topsoil.
- Welding materials, field.

8.45.4 ACCEPTANCE OF SMALL QUANTITIES OF MATERIALS

For small quantities of materials, the engineer may accept the materials using any of the following five methods:

1. Visual inspection provided the producer or manufacturer has recently furnished similar material found to be satisfactory.
2. Certification by the producer or manufacturer stating that the material conforms to the specification requirements.
3. Material is on the WisDOT Approved (pre-qualified) list.
4. All materials are to be supplied from a known manufacturer or producer in all cases.
5. Documentation in the project record detailing the quantity, producer, or manufacturer, and details of elements used for visual inspection and measurement are required in all cases.

The engineer may waive field sampling, testing, or source inspection of small quantities of materials under the following two conditions:

1. The material is not used for structurally critical items.
2. The material is not used for an item that could directly affect the safety of the traveling public.

The Materials Testing and Acceptance Guide, CMM 8.50, defines most items and the quantity thresholds for small quantity acceptance. Documented approval from the regional materials engineer or region person responsible for this area is required for approval of quantities exceeding those defined in CMM 8.50.

Waiver of laboratory or other routine testing does not constitute authorization to waive reasonable compliance.

8.45.5 EVALUATING FIELD TEST RESULTS

There are two categories of field test results, those for information and those for acceptance. Test results for information are used primarily as indicators for production control, moisture information, design purposes, etc. Acceptance tests are required at different stages in the construction process for the purpose of ensuring the final product has the characteristics known to provide a durable product. If the engineer feels these tests indicate an inferior product was produced, the engineer may elect not to accept the material at full payment and may even have it replaced.

The guidance provided in this section is generally applicable only to department (non-QMP) acceptance sampling and testing. The materials on which acceptance tests are performed in the field fall into two types; aggregates and mixtures. Though closely related, each has certain attributes that contribute to the durability and quality of the product. For a more in-depth analysis, contact the region person responsible for this area.

8.45.5.1 Aggregate Test Results

The evaluation of aggregate test results falls into four categories:

1. Continuing supply
2. Stockpile for initial or complete supply
3. Base course aggregates sampled from the roadway, and
4. Aggregates for, or from, mixtures.

Since aggregate gradation is inherently variable, test results to be representative of a large lot of material (batch, truck load, day's production) should first be based on tests of samples composed of a number of increments (to average out within batch variability), and secondly, be averaged with other sample test results (to average out batch-to-batch variability).

Several tests a day may be in order at the beginning of operations to establish the degree of variability existing due to the specific production, stockpiling, and handling procedures in use. Where observation of the aggregates and procedures as well as test results indicate uniformity within specification limits, the frequency may be reduced to two tests each day. Whenever test results fall outside the specification limits, another sample should be obtained as soon as possible and sampling frequencies increased until test results indicate specification compliance.

In order to reduce variability due to sampling and testing to a minimum and to provide the most equitable and unbiased basis for evaluation of specification compliance, the following guidelines should be adhered to.

8.45.5.1.1 Evaluating Continuing Supply

A continuing supply is defined as the situation where the aggregate supply used for producing mixtures is continually being added to and taken from.

Maintain a log or chart with individual test results and a running average of results of three or four consecutive tests. Figure 7 shows an example of how to determine running averages. When two consecutive test results fall outside the required limits, order corrective action. A running average close to the specification limits should serve as a warning to both engineer and contractor of probable impending trouble and possible rejection of material. A review of production and handling procedures should be made to determine whether changes are necessary to ensure that future running averages fall within the specified limits.

Whenever a change in source, a new pile, or proportions of batch weights is made, a new running average must be started.

CALCULATIONS FOR DETERMINING MOVING AVERAGES FOR PERCENTAGE PASSING
1-INCH SIEVE FOR GRADATION NO. 2 COARSE AGGREGATE FOR CONCRETE

SPECIFICATION = 20-55 PERCENT

TEST NO	DATE	TEST VALUE	SUM OF LAST 3 VALUES	AVERAGE OF LAST 3 VALUES	
1		40	-	-	
2		42	-	-	
3		50	132	44	
4		56	148	49	
5		52	158	53	
6		60	168	54	**Order corrective
7		50	162	54	action because 2
8		45	155	52	consecutive tests
9		44	139	46	exceed spec. limit
10		30	119	40	
11		57	131	44	
12		57**	144	48	
13		48	162	54	
14		46	151	50	
15		40	134	45	
16		42	128	43	
17		44	126	42	
18		45	131	44	
19		40	129	43	
20		41	126	42	

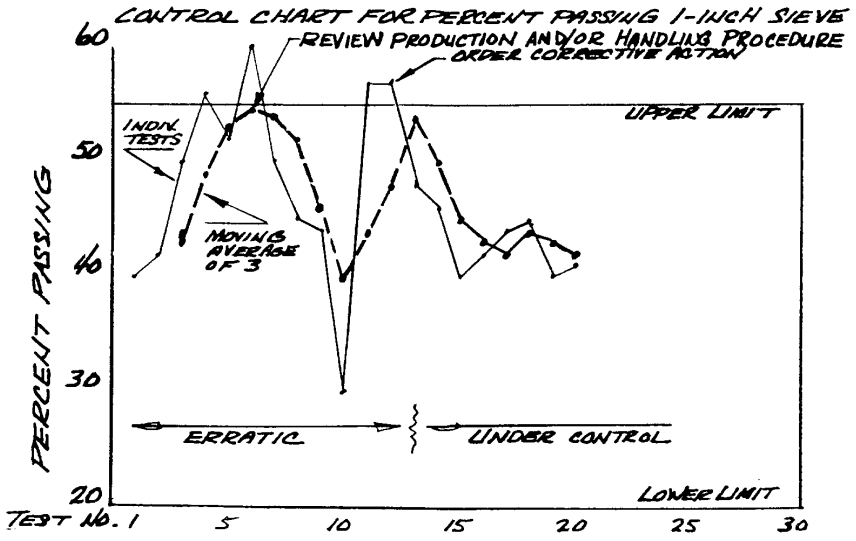


Figure 7: Calculations for Determining Running Averages

8.45.5.1.2 Evaluating Stockpile Supply

The acceptance of stockpiles for initial or complete supply should generally be limited to those stockpiles containing not more than a few hundred cubic yards erected for use in structures or in incidental or minor items of work.

If the initial test sample results fall within specification limits, the supply is acceptable. If it does not meet the requirements, obtain a second sample from quarter points approximately midway between the initial sampling. If the test results on the second sample meet requirements and the average results of the two tests meet the requirements, the supply is acceptable. If the second test results fail to meet the requirements the supply is unacceptable without correction.

In the event that the test results of the second sample meet requirements, but the average of results of the first and second sample do not, the contractor may be given the option of correcting the pile or obtaining a third sample. For the material to be acceptable under a third sampling, the results of test on the third sample, as well as the average of results of three tests, must meet specification requirements.

8.45.5.1.3 Evaluating Base Course Sampled from the Roadway

If the initial test results from the sampled unit, which represents a certain amount of production and/or area, fall

within the specification limits, the material is acceptable. If it does not meet requirements, obtain a second sample from within the same area represented by the first sample. If the test results of the second sample and the average of the test results of the two samples meet the requirements, the material is acceptable. If the second sample test result does not meet the requirements the material is unacceptable without correction. In the event the second sample test results meet the requirements, but the average of the tests do not, the contractor may be given the option of correcting the area or obtaining a third sample. For the material to be acceptable under a third sampling, the results of the tests on the third sample, as well as the average of the three tests, must meet the specification requirements. If at any time the area is reworked or aggregate blended, the sample sequence begins anew.

8.45.5.1.4 Exception to Averaging of Test Results

An exception to the "averaging" of test results of a number of samples in evaluating specification compliance is the situation where a lot of aggregate is, by visual examination, obviously not acceptable. Examples of this condition are a portion of a stockpile contaminated with dirt from hauling vehicles or soft foundation, a batch of single-size aggregate taken from an area of complete segregation, or a load of aggregate full of clay balls. The results of a test made to confirm judgment on a rejection in these cases should not be averaged with results of routine evaluation tests.

8.45.5.2 Mixture Test Results

8.45.5.2.1 Asphaltic Mixtures

The critical elements of asphalt paving are asphalt content, the amount of material passing the No. 200 (75µm) sieve, air voids in the mixture, and the density of the pavement. When there is a question of conformity, the analysis should concentrate on these elements.

8.45.5.2.2 Concrete Mixtures

The critical elements of Portland cement concrete are strength, air content, and slump. Strength and air content are directly related to performance, while slump may be an indicator of water-cement ratio, which most generally is an indicator of mix workability. When there is a question of conformity, the analysis should concentrate on these elements.

8.45.6 MATERIALS TEST RECORD

The test report record is a summary of all major testing and materials inspection accomplished on a project. The Materials Testing and Acceptance Guide enumerates those items that are to be included in the report. The test report record is to be kept for all contracts let to bid or entered into with the counties.

A draft of the test report record is to be compiled and kept current during the progress of a project for the following purposes:

- It will serve as a documentation that all materials have been and are being adequately tested and inspected.
- Concerned personnel will be able to review project materials control quickly and easily.
- If the engineer is reassigned elsewhere on another contract, that person's successor will have adequate records available.
- It will make possible the prompt submittal of the report in its final form after completion of the project.

This summary is also available through the Materials Tracking System.

8.45.6.1 Instructions for Completing the Report

It will be understood that a material met the specification requirements unless indicated by a “U” in the “Unsatisfactory” column. If material was rejected or failed to meet the requirements of the contract, the disposition of the material must be shown in the “Remarks” column. Other circumstances should be set forth under “Remarks”, supplemented as necessary with additional reports and comments.

When the quantity of a material used determines the testing frequency requirements, it will be necessary to report the actual quantity used. When acceptance requirements are the same regardless of the quantity involved, it will be necessary to provide information that will verify that all of the material incorporated into the work was within the specification requirements. This could be done by reporting a quantity such as “final” or “all” to help eliminate any doubt that all the material used met the specification requirements.

8.45.7 MATERIALS CERTIFICATION

DT 1310 Certification of Materials is required for all contracts let to bid or entered into with counties. Enter information electronically on the Certification of Materials form DT1310 in the Materials Tracking System (MTS) Lan or Materials Information Tracking System (MIT). Acceptance of materials and construction operations

controlled by sampling and testing that deviate from specified requirements must be noted on the form or as an attachment referenced on the form. When deviations do occur, the explanation of the deviation must include complete information on the following:

- Material.
- Use.
- Location of use.
- Quantity involved.
- Test results.
- Specification.
- Explanation and rationale for the disposition of the material.

The certification must be approved and signed by the project manager. One signed copy each of department form DT1310 is to be distributed as follows:

- Project files.
- FHWA for federal oversight projects.

An example of a completed form is shown in Figure 8.

Wisconsin Department of Transportation

09/12/2007

Certification of Materials Used on Highway Project

To: Director, Bureau of Highway Construction

Contract Id	Federal Project ID	Region	County	Highway / Route	Date Let	Proposal #
20050111001	NH 2005066	SW	GRANT	USH 151	01/11/05	001

Contractor
H. JAMES & SONS, INC

Project Id	Project Description
1209-02-76	Dickeyville - Belmont Road

The results of the tests on acceptance samples indicate that the materials incorporated in the construction work, and the construction operations controlled by the sampling and testing, were in conformity with the approved plans and specifications; and such results compare favorably with the results of the independent assurance sampling and testing. Exceptions to the plans and specifications are explained as follows and are documented in the project records.

Project Manager: Tadd Owens

Company Name: WDOT

Project Manager (Signature): _____

Date Signed: _____

Material Description: Concrete Prestressed Girders

Disposition Explanation: Qty: 0 Units: LINEAL FEET

Test No. 0-106-0033-2005 was a test performed on uncoated steel strand for prestressed concrete. Two samples were taken and one of the samples failed. The sample for heat # D362384 failed to meet 3.5% minimum elongation and failed to meet the minimum 260.7 kN breaking strength requirement. The plant was notified by e-mail and a resample was requested. Test No. 0-106-0034-2005 is the retest for heat # D362384 and the test is satisfactory. Therefore, heat # D362384 is acceptable.

Usage: none

Location: none

Spec Requirements:
260.7 kn min breaking strength and 3.5% elongation

Test Results:
258 kn breaking strength and 3.3% elongation

Material Description: Base Aggregate Dense 1 1/4"

Disposition Explanation: Qty: 1393.91 Units: TON(S)

Test No. 1-217-0139-2005 was a QV test on Base Aggregate Dense 1-1/4 -inch from station 23+35 to 24+35 SL line, 8/9/2005. The material source was from the Hoffman Construction road cut on Project 1209-02-75. The QC test (test #18) on the same day was in specification, 22.6%. The QV and QC did not correlate. Therefore, the QV test was plotted as a QC test on the contractor's running average charts. The QV plotted as a QC test caused the running average on the #40 sieve to be out of specification by .1%. The material was accepted because the contractor's QC test was within specifications and the next day's test brought the running average within the warning band. Close communication was continued between the contractor and WDOT to ensure that there were not future problems.

Usage: roadway base

Location: station 23+35 to 24+35 sl line

Spec Requirements:
#40 sieve 7-25%

Test Results:
#40 sieve 28.0%

Figure 8: Example DT1310, Certification of Materials Used on Project